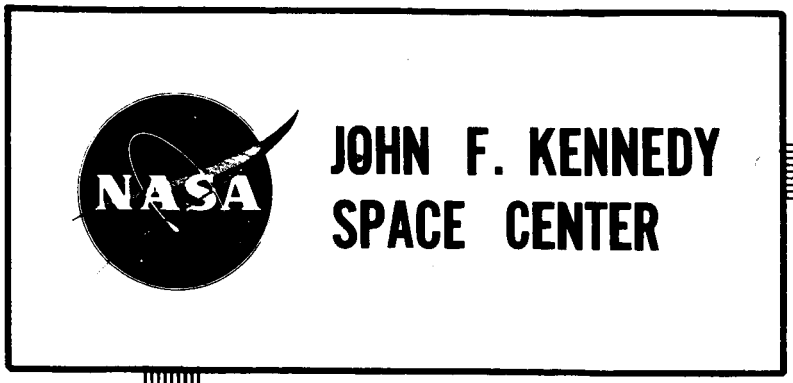

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NOISE: EFFECTS ON MAN AND MATERIALS

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PREFACE

By definition, noise is unwanted sound. It may be the roar of a rocket at blast-off, or it may be a sound which causes only minor annoyance such as the noise of a back-firing car. Scientists have devised a new term for the noise which surrounds us. They call it noise pollution and consider it just as serious a problem as air pollution and water pollution.

The launching of space vehicles, whose engines generate millions of pounds of thrust and whose noise fields extend over large areas, has resulted in an active interest at the Kennedy Space Center in all aspects of the noise problem. This bibliography is an attempt to satisfy this interest.

The compiler has limited the selection of references to material on audioacoustic noise. However, because of the nature of the subject material, some references to the literature of electrical noise were considered germane and were therefore included.

The bibliography is arranged alphabetically by title. All entries include a short annotation except document entries that carry a "Confidential" security classification. Classified documents may be seen only if the requester has a KSC Form 10-36, Library Field of Interest Register, on file with the Library. All entries are available in the KSC Library.

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ACOUSTIC AND VIBRATION ENVIRONMENTS AND TEST SPECIFICATION LEVELS GROUND SUPPORT EQUIPMENT LAUNCH COMPLEX 39. John F. Kennedy Space Center. KSC SP-4-38-D Revised July 27, 1964

This document has been prepared to provide the acoustic and vibration environmental levels expected for several areas of Launch Complex 39 during three launch periods.

ACOUSTIC MEASUREMENTS. L. L. Beranek. Wiley 1949 refs (QC 227/B482)

This is a basic reference book in the field of acoustics.

ACOUSTIC NOISE, AND VIBRATION STUDIES AT CAPE CANAVERAL MISSILE TEST ANNEX, AMR. Aeronautical Systems Div. ASD Tech. Rpt Dec. 1962 (FOUO) 287 p

This report describes a measuring program to collect acoustic environmental data at Cape Canaveral during the launchings of 23 vehicles.

AN ACOUSTICAL STUDY OF THE KIWI B NUCLEAR ROCKET. National Aeronautics and Space Administration. NASA CR-370 Jan. 1966 116 p

Sound pressure generated by the exhaust of the KIWI B nuclear rocket engine has been measured and the data analyzed.

ACOUSTICAL TERMINOLOGY, INCLUDING MECHANICAL SHOCK AND VIBRATION. American Standards Association. ASA S1.1-1960 62 p

This document lists the definition of all terms pertaining to acoustics, shock, and vibration.

ACOUSTICS AND VIBRATIONAL PHYSICS. R. W. B. Stephens and A. E. Bates. St. Martin's Press 1966

This book,primarily a textbook, was first published in 1950 as Wave Motion and Sound. In this edition new chapters have been added and the subject matter redistributed.

AEROSPACE NOISE. G. A. Wilhold. Astronautics and Aeronautics May 1967 p 64-69 refs

This article reviews the background of noise prediction, points out current problems, and draws attention to the acoustic model research facility at NASA's Marshall Space Flight Center.

AIRCRAFT NOISE. School of Aviation Medicine. SAM Review 3-60 June 1960 29 p refs (AD 244 126)

This report gives special attention to the hazardous noise environment of men working on and near aircraft on the ground.

AIRCRAFT NOISE AND SONIC BOOM--SELECTED REFERENCES. Federal Aviation Agency. FAA Bibliographic List No. 13 Oct. 1966 112 p

"This bibliography is a partially annotated compilation of selected references with concentration of coverage 1960 to date, arranged by subject." Author

AIRCRAFT NOISE--MITIGATING THE NUISANCE. With comments by J. E. Richards et al. Astronautics and Aeronautics Jan. 1967 p 34-45 refs

Professor Richards presents a broad examination of the growth of noise nuisance which can be used at any airport once the general passenger traffic has been established and the kinds of routing predicted.

ALLEVIATION OF JET AIRCRAFT NOISE NEAR AIRPORTS. Office of Science and Technology. OST Report Jet Aircraft Noise Panel March 1966 167 p

This report contains the views of 27 specialists on the aircraft noise problem. General conclusions and principal recommendations are presented for measurements and standards, reduction of engine noise, operational considerations, and compatible land usage.

AMERICAN STANDARD METHOD FOR THE MEASUREMENT OF THE REAL-EAR ATTENUATION OF EAR PROTECTORS AT THRESHOLD. American Standards Association. ASA Z24.22-1957 10 p

This specification gives the procedures for evaluating real-ear attenuation of ear protectors at threshold.

THE ANATOMY OF NOISE. L. L. Beranek and L. N. Miller. Machine Design Sept. 14, 1967 p 174-183

"Noise is a true operating characteristic of an engineered device, as real as power, strength, or speed. It can be defined, measured, contained, prevented, even legislated against. Perhaps more important, acoustics' experts now have reasonably accurate ideas on just how much din you can create without annoyance, harm, or legal liability." Author

APPRAISAL OF APOLLO LAUNCH NOISE. B. O. French. Aerospace Medicine July 1967 p 719-721 refs

This study describes a noise program completed at the Manned Spacecraft Center, Houston, Texas, to ensure that the Apollo mission noise would not be detrimental to the crew. Results indicate that the noise generated during launch will not adversely affect the Apollo crew.

ARCHITECTURAL ACOUSTICS: A PROBLEM OF MEASUREMENT. W. Siekman. Frontier Autumn 1966

The author expresses concern over the increasing number of civil suits being brought against architects and contractors for improper noise control. He suggests two methods of measuring the acoustical properties of building components, and three ways of accomplishing noise reduction. The work being done at Riverbank Acoustical Laboratories is related.

AUTOMATIC LOUDNESS ANALYSIS. H. Blasser and H. Finckh. Hewlett-Packard Journal Nov. 1967 p 12-20

"Measuring the subjective sensation of loudness is easy if you have one of these calibrated electronic ears." Authors

BANNING THE BOOM. Time Oct. 6, 1967 p 67

Santa Barbara's proximity to several Navy and Air Force bases has caused it to be bombed with the sonic boom. In an attempt to protect the city from the boom, the city council passed an ordinance declaring a sonic boom "an unlawful public nuisance" with fines up to $500 or 60 days in jail.

BOOM OR BUST? Newsweek July 17, 1967 p 61

This discusses the Ministry of Technology plan to measure British tolerance of sonic boom noise with unannounced "boom-bardments."

BOOM PROBLEM STILL CLOUDS SST FUTURE. C. M. Plattner. Aviation Week and Space Technology Jan. 9, 1967 p 28-29

Results of studies by government agencies and industry indicate that design changes in the SST could cut overpressures by 20 percent but would be impractical.

CALCULATED NOISE LEVELS OF SATURN AND SATURN SCALE MODEL ENGINES. Army Ballistic Missile Agency. ABMA-DSF-TM-13-59 Aug. 1959 3 p (Confidential)

No abstract.

A CARPET OF SOUND. Fortune Feb. 1967 p 117

This short article describes the sonic boom as a "sort of atmospheric tidal wave that rolls across the earth in the wake of the flight path." The wave at ground level generated by the SST is about 64 miles wide.

COMBUSTION NOISE OF ROCKET MOTORS. B. Langenecker and A. I. Moore. American Rocket Society, 17th annual meeting, Los Angeles, 1962. Paper 2710-62 6 p (A63-15317)

The authors report the results of their research on the effects of sound waves on the strength and plasticity of metals. They found that sonic and ultrasonic radiation having sound pressure levels above 10^7 dyn/cm^2 not only may reduce the static yield stress of metals down to zero, but may also cause fracture.

A COMMITTEE STUDY OF BLAST POTENTIALS AT THE SATURN LAUNCH SITE AND A CONTRACTOR STUDY OF BLAST FORCES ON STRUCTURES. Army Ballistic Missile Agency. ABMA-DMM-TR-9-60 Feb. 1960 51 p

This study was undertaken to analyze the effects of the explosive blast on Saturn structures and buildings already sited as well as to evaluate safe siting distances for additional facilities.

COMMUNITY NOISE AND HEARING LOSS. J. D. Dougherty and O. L. Welsh. New England Journal of Medicine Oct. 6, 1966 p 759-765 refs

The authors state that community noise exposure is often above maximum standards for industry. Industrial studies show that continued exposure to a level of 80 decibels can bring about loss of hearing. Several common and recurring noise sources which exceed 80 decibels are named.

CONTROL HOUSES ARE GIRDED TO SURVIVE BOOM. Chemical Engineering March 13, 1967 p 96+

This news item tells what has been done at a Gulf Coast Petroleum Refinery to reduce explosion damage to control buildings.

CRITICAL LITERATURE SURVEY OF MISSILE BLAST RESISTANT MATERIALS. Illinois University/Ceramic Engineering Rpt 6-1 June 1965 103 p (AD 620 335)

No abstract.

DANGEROUS DECIBELS. Dun's Review June 1963 p 45-46+

This article tells what industry is doing to fight one of the side-effects of the production line--the noise problem. The cost to industry is stressed.

DEFINITIONS AND PROCEDURES FOR COMPUTING THE PERCEIVED NOISE LEVEL OF AIRCRAFT NOISE. Society of Automotive Engineers. SAE ARP 865-1964 8 p

In these procedures, perceived noise level in PMDB is computed from the spectral analysis of the aircraft noise, in octave bands of frequency.

DESCRIPTIONS OF FLYOVER NOISE SIGNALS PRODUCED BY VARIOUS JET TRANSPORT AIRCRAFT. Federal Aviation Agency. FAA DS-67-18 Aug. 1967 (AD 657 633)

This report provides descriptions of maximum levels and time durations for 45 flyover noise signals produced by a variety of turbojet and turbofan transport aircraft in current airlines service.

DETERMINATION OF ROCKET ENGINE NOISE DAMAGE TO COMMUNITY DWELLINGS NEAR LAUNCH SITES--FINAL REPORT. Martin Company. Martin CR-64-65 v 1-2 Dec. 1964

The overall objective of the study was to determine rocket engine noise damage thresholds of community buildings near the John F. Kennedy Space Center. This objective was satisfied in six steps: literature survey, community survey, noise level survey, field tests, laboratory tests, and data analysis.

THE DEVELOPMENT OF DAMAGE INDEXES TO STRUCTURES DUE TO LIQUID PROPELLANT EXPLOSIONS. Ohio River Div. Lab. Eng. Corps. TR-4-50 April 1966 37 p

This report demonstrates the feasibility of developing damage factors which may be applied to structures in the vicinity of the launch pad of a space vehicle, should there be an explosion prior to or during the liftoff.

DO'S AND DON'T'S FOR NOISE REDUCTION AND CONTROL. Navy Bureau of Ships. NAVSHIPS 345-2-60 Dec. 1960 7 p (AD 815 240)

"This list has been compiled to assist engineers and Naval architects in designing and selecting structures and machinery for ships to achieve noise reduction and control." Authors

EFFECTS OF OVERPRESSURE ON THE EAR--A REVIEW. Defense Atomic Support Agency. DASA 1858 Nov. 1966 31 p refs (AD 653 129)

"Information regarding blast effects on the ear has been reviewed in an attempt to gather quantitative information available for animals and man for help in the establishment of relationships between various levels of overpressure and the incidence of eardrum failure, the degree of damage to the middle and inner ear, and other identifiable sequelae referable to cochlear or vestibular functions." Author

EFFECTS OF SATURN VEHICLE LAUNCH NOISE ON WINDOW GLASS. Kennedy Space Center. KSC TR-99-1 Dec. 15, 1965 23 p

A detailed study was conducted by the NASA Safety Office to determine the maximum permissible safe sound pressure level at the land boundaries of Cape Kennedy Air Force Station and Kennedy Space Center.

THE EFFECTS OF SHOCK AND VIBRATION ON MAN. American Standards Association. ASA Rpt S3-W-39 Jan. 1960 refs

This report, which closely parallels chapter 44 in volume 3 of the Shock and Vibration Handbook, is an interim solution to the numerous requests for information on the effects of shock and vibration on man. The Sectional Committee on Bioacoustics of the American Standards Association (now United States of America Standards Institute) recommends this report as pertinent background and reference material on human vibration research.

EFFECTS OF SONIC BOOM ON PEOPLE: REVIEW AND OUTLOOK. H. E. von Gierke. Journal of the Acoustical Society of America v 39 no. 5 pt 2 May 1966 p S43-S50 refs

This article, which is an introduction to the second part of the Sonic Boom Symposium, reviews the history of observations on human reactions to the sonic boom from the time when the boom was a curiosity to the present day when popular reaction to the boom is a scientific problem.

EFFECTS OF SONIC BOOM ON PEOPLE: ST. LOUIS, MISSOURI, 1961-1962. C. W. Nixon and P. N. Borsky. Journal of the Acoustical Society of America v 39 no.5 pt 2 May 1966 p S51-S64 refs

From data obtained from over 2,300 direct interviews, analyses of complaints, and engineering evaluations of alleged damage, it was shown that there were some interference with routine living activities, some superficial building damage, and no direct adverse physiological effects.

EFFECTS OF SONIC BOOM ON STRUCTURAL BEHAVIOR. J. H. Wiggins, Jr. Materials Research and Standards June 1967 p 235-245 refs

This report summarizes the findings of the boom damage analysis in the FAA sonic boom experiment. The author describes the natural causes of cracking in plaster and other finishing materials as well as boom-caused cracking.

THE ERA OF SUPERSONIC MORALITY. J. Lear. Saturday Review June 6, 1964 p 49-50. Discussion. July 4, 1964 p 46-47

Despite the promise that their city would have America's first supersonic airport, the people of Oklahoma City showed little tolerance for the sonic boom. Complaints filed to stop the experiment were overruled. Comments made in letters to the editor indicate strong objection to "progress that disregards the rights of the individual."

ESTIMATED ACOUSTICAL ENVIRONMENT AT COMPLEX 39 DURING SATURN V LAUNCH. Bolt Beranek and Newman, Inc. BBN Rpt 1202 March 1965 refs

This report presents the acoustical environmental data measured on various SATURN I launches. The confidence levels for the data and the techniques used in predicting the acoustical environment at Launch Complex 39 are discussed.

ESTIMATED NOISE PRODUCED BY LARGE SPACE VEHICLES AS RELATES TO ESTABLISHING TENTATIVE SAFE DISTANCES TO ADJACENT LAUNCH PADS AND THE COMMUNITY. Wright-Patterson/MRL Memo M-2 April 1962 16 p

The purpose of this memorandum is to provide a current "best estimate" of the probable noise environments during launchings of certain future space vehicles. Tentative criteria are also indicated for siting these large vehicle launch pads with respect to adjacent pads and the community.

EXPERIENCE IN THE UNITED KINGDOM ON THE EFFECTS OF SONIC BANGS. C. H. E. Warren. Journal of the Acoustical Society of America v 39 no. 5 pt 2 May 1966 p S59-S64 refs

This paper summarizes the results of the exercises involving the making of bangs staged in the United Kingdom over the past 5 years. Information has been obtained on the intensities and waveforms of sonic bangs as measured outdoors, on the nature of disturbances inside buildings, and on the subjective reactions of people to those bangs.

EXPERIMENTAL AND THEORETICAL STUDIES OF JET NOISE PHENOMENA. Aeronautical Systems Division. ASD-TDR-62-303 June 1962 163 p refs (AD 282 273)

Overall sound pressure levels were measured in an anechoic room for noise generated by cold air flow through more than 20 different nozzle configurations. The results are examined in terms of overall acoustic power and directivity versus mass flow. Theoretical discussions are presented concerning the generation of sound and the relationship between various turbulence and statistical theories.

AN EXPERIMENTAL EVALUATION OF MAXIMUM BLAST EFFECTS IN THE FAILURE OF THE SATURN VEHICLE. Arthur D. Little, Inc. ADL Rpt C-102,321 April 1962 (Confidential)

No abstract.

EXPRESSION OF THE PHYSICAL AND SUBJECTIVE MAGNITUDES OF SOUND OR NOISE. International Organization for Standardization, Switzerland. ISO/R 131-1959 8 p

The ISO recommends that data on the physical magnitude of sound or noise should be expressed by a statement of the sound pressure level or in terms of the sound intensity level or sound power level.

EXTERIOR SOUND AND VIBRATION FIELDS OF A SATURN VEHICLE DURING STATIC FIRING AND DURING LAUNCHES--FINAL REPORT. Bolt, Beranek and Newman, Inc. BBN Rpt 764 Aug. 29, 1960 refs

The primary objective of the program was to assess the possible exterior damage effect of the firings to nearby building structures, and to investigate possible adverse reactions from nearby residential communities.

FACTORS RELATING TO THE AIRPORT-COMMUNITY NOISE PROBLEM. H. H. Hubbard et al. In: Conference on Aircraft and Operating Problems, Langley Research Center. May 10-12, 1965 p 73-81 (NASA SP-83)

The noise problems discussed are associated with aircraft landing approaches, takeoffs, and climbouts in communities near commercial airports.

FAR-FIELD ACOUSTIC ENVIRONMENTAL PREDICTIONS FOR LAUNCH OF SATURN V AND A SATURN V MLV CONFIGURATION. National Aeronautics and Space Administration. NASA TN D-4117 Sept. 1967 29 p

The authors say that more accuracy must be used in the prediction of the far-field acoustic environments than can be provided by the more conservative methods of considering static vehicle conditions.

FAR FIELD NOISE AND VIBRATION LEVELS PRODUCED DURING THE SATURN SA-1 LAUNCH. J. N. Cole and C. E. Thomas. Air Force Systems Command. AFSC ASD TR 61-607 Dec. 1961 (AD 273 666)

"Acoustic measurements were made of the sound pressure level-time functions which were produced at six locations on Cape Canaveral Missile Test Annex and at four locations in the surrounding communities during the Saturn SA-1 launch on October 7, 1961." Authors

FIELD AND LABORATORY MEASUREMENTS OF AIRBORNE AND IMPACT SOUND TRANSMISSION. International Organization for Standardization, Switzerland. ISO/R 140-1960

This ISO recommendation defines methods of measuring the airborne sound insulation of walls, and the airborne and impact sound insulation of floors, both in the field and in the laboratory.

THE FIGHT AGAINST JET NOISE. Extension of remarks of Hon. John W. Wydler. Congressional Record Aug. 3, 1967 p A3930-A3932

This contains a verbatim account of the article by Irwin Hersey entitled "Decibels Demanding Attention" which appeared in the July issue of Airline Management and Marketing.

FREQUENCY SPECTRUM AND TIME DURATION DESCRIPTIONS OF AIRCRAFT FLYOVER NOISE SIGNALS. Federal Aviation Agency. FAA DS-67-6 May 1967 (AD 654 927)

Thirty-two flyover noise recordings were analyzed and compared with respect to characteristics currently used to assess the noisiness of the flyover signal.

GAINING PUBLIC ACCEPTANCE OF THE SONIC BOOM PHENOMENON THROUGH PUBLIC RELATIONS. W. H. Martin. (Thesis) Boston Univ. 1963 (Ref/HM261/M383)

This study attempts to show how the United States Air Force has applied an intensive program of public relations to gain public tolerance of the sonic boom.

GAUGING A NOISE'S ANNOYANCE LEVEL. Electronics Feb. 6, 1967 p 202

This short article relates the scheme outlined by Wolfgang Hawel at a conference on acoustic noise control in London. Hawel thinks he can develop an electronic instrument that will gauge noise annoyance.

GENERAL-PURPOSE SOUND LEVEL METERS. American Standards Association. ASA S1.4-1961 13 p

The purpose of this standard is to ensure maximum practical accuracy in any particular sound level meter and to reduce differences in corresponding readings with various makes and models of meters meeting the standard.

GIANT SONIC BOOM CAUSES ONLY MINOR DAMAGE TO HOUSES. E. C. Shuman. Materials Research and Standards Feb. 1965 p 79-80

The author describes what happened when an accidental sonic boom of great intensity occurred during a demonstration at White Sands Missile Range on December 2, 1964.

GROUND SUPPORT EQUIPMENT DESIGN FOR OPERATION IN SEVERE ACOUSTIC AND VIBRATION ENVIRONMENTS. Hayes International Corp. Hayes Engr. Rpt 737 Sept. 30, 1962

The noise produced by large rocket boosters is capable of producing serious malfunctions and failures in ground support equipment.

A GUIDE TO HEARING CONSERVATION IN NOISE EXPOSURE. National Aeronautics and Space Administration. NASA NHB 1840.1 Oct. 1965 22 p

This document presents a guide for the consideration, establishment, and conduct of hearing conservation programs in steady-state noise exposure.

HANDBOOK OF NOISE CONTROL. C. M. Harris, ed. McGraw-Hill 1957 refs (TA365/H313)

This is an authoritative work covering the entire field of noise control. Each chapter covers a particular subject and is written by an expert on the subject.

HANDBOOK OF NOISE MEASUREMENT. A. P. G. Peterson and E. E. Gross, Jr. 6th ed. 1967 282 p (QC243/P485b)

"The purpose of this book is to help those who are faced, possibly for the first time, with the necessity of making noise measurements." Authors

HAZARDOUS EXPOSURE TO INTERMITTENT AND STEADY-STATE NOISE. K. D. Kryter et al. Journal of the Acoustical Society of America March 1, 1966 p 451-464 refs

This document was prepared by Working Group 46 of the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council. The paper contains graphs of maximum soundpressure levels and durations of exposures which the Working Group believes would be tolerable.

HAZARDOUS NOISE EXPOSURE. Air Force. AFR 160-3 Oct. 19, 1956 AFR 160-3A June 27, 1960 AFR 160-3B Feb. 7, 1967

These Air Force regulations establish a program to minimize the undersirable effects of noise on Air Force personnel.

HUMAN PERFORMANCE AS A FUNCTION OF CHANGES IN ACOUSTIC NOISE LEVELS. Aerospace Medicine Research Lab. AMRL-TR-65-165 Dec. 1965 13 p (AD 628 198)

Psychomotor performance of 16 subjects was evaluated under four noise conditions, during four test sessions in a Latin square design. Three experimental conditions each began with different intensities of noise.

HUMAN RESPONSES TO SONIC BOOM. E. W. Nixon. Aerospace Medicine May 1965 p 399-405 refs

This paper discusses the impact of the sonic boom phenomenon upon humans in terms of characteristics of the sonic boom, the nature of human response, factors influencing acceptance of the boom, the relationship of minor damage to property to human reactions, and possibilities of direct and indirect personal injury.

INFRASOUND TESTS HUMAN TOLERANCE. H. M. David. Missiles and Rockets Oct. 11, 1965 p 31+

Air Force scientists at the Aerospace Medical Research Laboratories (AMRL) at Wright-Patterson AFB, Ohio, have conducted tests proving that short-duration exposure to low-frequency noise up to 150 db is within the human tolerance range.

AN INVESTIGATION OF AERODYNAMIC NOISE MEASURED ON AN 0.055-SCALE APOLLO/SATURN I VEHICLE IN THE NASA AMES 14-FOOT TRANSONIC AND 9-BY 7-FOOT SUPERSONIC WIND TUNNELS. North American Aviation. NAA SID 63-1480 Dec. 1963 80 p (Confidential)

No abstract.

INVESTIGATION OF THE ACOUSTIC ENVIRONMENT OF LARGE BOOSTER SYSTEMS - FINAL SUMMARY REPORT. Bolt, Beranek & Newman, Inc. BBN Rpt 923 May 1962 25 p

This report contains a chronological listing of the important letter reports submitted to Marshall Space Flight Center and describes the results of their investigations.

IS INDUSTRIAL NOISE COSTING YOU MONEY? B. Wels. Mill & Factory April 1967 p 68-70

As modern rates of production increase, noise levels in industry will also increase. The author gives valuable information on the nature of industrial noise, what it can do to you, and what you can do about it.

IS NOISE DRIVING YOU CRAZY? J. H. Winchester. Science Digest Aug.1964 p 27-31

The author contends that noise can actually drive you crazy. The article stresses what the individual can do to avoid troublesome noise in his home environment.

IS IT IMPACT OR CONTINUOUS NOISE? H. L. Williams and A. J. Majer. Archives of Environmental Health Oct. 1963 p 37-40 refs

The authors undertook a study to determine the number of impulses per second needed to produce steady-state noise. Their study indicates that repeated impulses in excess of 18.80 per second behave as steady-state noise.

IS THE NOISE GETTING YOU DOWN? R. Brecher and E. Brecher. Saturday Evening Post Feb. 6, 1960 p 32-33

Interesting examples of noise pollution in military, industrial, and community fields are given. The author quotes Professor Bolt of Bolt, Beranek and Newman, Inc. and Massachusetts Institute of Technology who says our "affluent society" should add to its want list an atmosphere not polluted by noise.

JET ENGINE NOISE. National Safety Council. Data Sheet 580 1966 8 p refs

The Air Transport Section of the National Safety Council lists in this data sheet the procedures to be followed to protect personnel against injury due to harmful noise levels.

LABORATORY TESTS OF PHYSIOLOGICAL-PSYCHOLOGICAL REACTIONS TO SONIC BOOMS. K. D. Kryter. Journal of the Acoustical Society of America v 39 no. 5 pt 2 May 1966 p S65-S72 refs

The author reviews various experiments showing psychological and physiological reactions to impulsive acoustic stimuli and to sonic booms at the intensities anticipated from commercial supersonic aircraft.

LABORATORY TESTS OF SUBJECTIVE REACTIONS TO SONIC BOOMS. National Aeronautics and Space Administration. NASA CR-187 34 p

A group of test participants operating under controlled conditions in a special laboratory chamber compared the subjective acceptability or noisiness of sonic booms (simulated) that would be heard outdoors and indoors with the sound of subsonic jet aircraft and bands of filtered white noise. Some factors involved in estimating community response to aircraft noise are discussed.

LAND USE PLANNING WITH RESPECT TO AIRCRAFT NOISE: DISCUSSION OF A NEW PROCEDURE. E. Guild et al. Aerospace Medicine Aug. 1964 p 719-723 refs

The authors discuss the procedure outlined in a tri-service manual which was developed through a joint DOD-FAA-contractor effort. Generalized noise contours which permit noise estimation produced during takeoff, landing, and runup operations form the basis of the procedure.

THE LAW OF NOISE. Time Sept. 10, 1965 p 37-38

This article quotes from a report by Manhattan lawyer George A. Spater,which appeared in the Michigan Law Review. Lawyer Spater urges the courts to hold the line that no recovery for damages will be allowed for the mere annoyance caused by sonic booms. Other lawyers, however, feel that the Supreme Court may eventually embrace the new doctrine that appears to treat noise alone as damaging, even without a physical invasion.

LEARNING TO LOVE THE BOOM. Time May 7, 1965 p 64-67

As a result of the supersonic transport (SST) tests in Oklahoma City, 9,594 people complained of damage to buildings, 4,629 filed formal damage claims,and 229 collected $12,845.32 mostly for broken glass and cracked plaster. The FAA summed up the test results by urging more study.

LEARNING TO LOVE THE BOOM. Engineering News Record June 15, 1967 p 24

This editorial criticizes FAA's "high-handed" attitude toward public tolerance of the noise generated during the testing of the SST in Oklahoma City.

LOUDNESS EVALUATION. W. E. Ohme. Hewlett-Packard Journal Nov. 1967 p 2-11 refs

"Effective noise abatement calls for instruments that can measure loudness. But loudness is subjective, and instruments aren't like people." Author

MEASUREMENT OF NOISE EMITTED BY VEHICLES. International Organization for Standardization, Switzerland. ISO/R 362-1964 8 p

This ISO recommendation describes methods of determining the noise emitted by motor vehicles.

MEASURING NOISE. J. Campbell. Machine Design Sept. 14, 1967 p 216-224 refs

The author analyzes methods of measuring various types of noise.

A MECHANICAL SHOCK PULSE SURVEY. Army Electronics Command. Army ECOM TR-2647 Dec. 1965 37 p (AD 627 467)

This report is based on a presentation by Mr. Francesco Palmisano at the Thirty-fifth Shock and Vibration Symposium held in New Orleans, October 26-29, 1965.

METEOROLOGICAL ASPECTS OF THE SONIC BOOM. Federal Aviation Agency. FAA SRDS RD 64-160 Sept. 1964 34 p (AD 610 463)

This Boeing report investigated the influence of variations in atmospheric temperature, pressure, and wind on sonic boom noise.

NASA BEGINS MAJOR ENGINE NOISE PROJECT. M. L. Yaffee. Aviation Week & Space Technology Aug. 21, 1967 p 38-47

Langley Research Center is conducting a "Quiet Engine" study to develop a new engine that will show a reduction in perceived noise level on aircraft takeoff and landing.

NATURE OF THE SONIC BOOM. H. H. Hubbard. Journal of the Acoustical Society of America v 39 no. 5 pt 2 May 1966 p S1-S9

A brief discussion is given of the nature of the sonic boom problem, including references to the basic concepts involved, exposure patterns, factors affecting exposures, response phenomena, and techniques for alleviation.

NOISE. J. C. Guignard. In: J. A. Gillies, ed. A Textbook of Aviation Physiology 1965 p 895-967 refs (RC 1075/G 481)

Chapter 30 is devoted to a comprehensive review of noise in aviation. The physical nature of sound and the principles of noise measurement are reviewed. The psychology of noise is also considered.

NOISE. C. M. Harris. Environmental Science and Technology April 1967 p 292-296 refs

The author defines noise control as the technology of achieving an acceptable noise environment consistent with economic and operational considerations. He says that the major sources of noise pollution in cities are those associated with transportation, building construction, and street repair. He believes that the only remedy for the noise problem is control through legislation.

NOISE. L. L. Beranek. Scientific American Dec. 1966 p 66-76

The author expresses concern over modern man's noisy environment, relates what has been done, and suggests what can be done to alleviate the problem.

NOISE BECOMING PUBLIC HEALTH HAZARD. Science Journal April 1967 p 7

This is a digest of the article on community noise and hearing which appeared in the October 6, 1966 issue of "New England Journal of Medicine."

NOISE CONSIDERATIONS IN THE DESIGN AND OPERATION OF AIRCRAFT. National Aeronautics and Space Administration. NASA RP-137 178 p refs

This paper presents a broad view of the generation and transmission of aircraft noise, and the response of humans and structures to the noise. Research on noise sources during the last decade are also reviewed.

A NOISE EXPOSURE DURATION INDICATOR. R. A. Strong and K. K. Neely. Journal of Sound and Vibration Jan. 1966 p1-2

This technical note describes an instrument which has been developed to record the cumulative time for which one of five preset sound pressure levels of noise is exceeded.

NOISE FROM AIRCRAFT OPERATIONS. Aeronautical Systems Division. ASD TR 61-611 Nov. 1961 121 p (AD 278 625)

"This report provides a summary and generalization of knowledge on aircraft ground and flight operations in the vicinity of air bases, noise source characteristics of military aircraft, and propagation of sound from aircraft to observers in the vicinity of or on air bases." Author

NOISE GENERATION BY OPEN TURBULENT FLAMES. T. J. Smith and J. K. Kilham. Journal of the Acoustical Society of America May 1963 p 715-724 refs

The authors postulate that any turbulent flame may be represented by an acoustic model consisting of a distribution of monopole sources or radiation of varying strengths and frequencies throughout the zone of combustion. The results of the study reported confirm this assumption.

NOISE: ITS EFFECT ON MAN AND MACHINE. Congress, House 86th HR2229 1960 51 p

This report was submitted to the House of Representatives by Overton Brooks, Chairman of the Special Investigating Subcommittee of the Committee on Science and Astronautics.

NOISE: ITS EFFECT ON MAN AND MACHINE. Hearings before the Special Investigating Subcommittee of the Committee on Science and Astronautics. Congress, House 86th CSA Hearings #13 Aug. 23-25, 1960 260 p

These Hearings search for a scientific solution to the noise problem. There is included for the record an article by H. O. Parack entitled "Noise, Vibrations, and People" which appeared in the November 1956 issue of "Noise Control."

NOISE MENACE THREATENS MAN. B. J. Culliton. Science News Oct. 15, 1966 p 297-299

Noise is considered by many a necessary companion to technological progress. Physiological trauma induced by noise exposure, and other noise hazards are discussed.

NOISE NUISANCE MAY CAUSE REDESIGN OF JET ENGINES. Machine Design July 6, 1967 p 14

This item quotes from comments made by Dr. Mac C. Adams of Lockheed Aircraft Corporation regarding the need for redesigning the jet engine in order to make engine noise an "acceptable nuisance."

NOISE POLLUTION: A GROWING MENACE. M. Brower. Saturday Review May 27, 1967 p 17-19

In the United States alone, 11,000,000 adults and 3,000,000 children suffer from some form of hearing loss. A certain proportion of cases are clearly related to exposure to excessive noise.

NOISE PROBLEMS ASSOCIATED WITH LAUNCHING LARGE SPACE VEHICLES. A. A. Regier et al. Sound Nov.-Dec. 1962 p 7-12 refs

Characteristics of engine noises predicted for large rocket-powered vehicles are discussed. Observations are also made on the response of ground building structures to noise and on some facilities and techniques for studying the effects of intense low-frequency noise.

NOISE RADIATION FROM FOURTEEN TYPES OF ROCKETS IN THE 1,000 TO 130,000 POUNDS THRUST RANGE. Wright Air Development Center. WADC TR57-354 Dec. 1957 63 p (AD 130 794)

Detailed noise characteristics were measured on 14 types of rockets with both solid and liquid propellants, in the thrust range from 1,000 to 130,000 pounds.

NOISE REDUCTION. L. L. Beranek. McGraw-Hill 1960 refs

This book is not intended to be a handbook or all-inclusive compendium, but each man with a noise problem should find assistance. The text seeks to lead the reader from the beginning of the subject on into its more advanced aspects.

NOISE SUPPRESSION SYSTEM QUIETS THE JET'S BLAST. Safety Maintenance March 1967 p 45

The Marine Corps at El Toro, California, has devised a noise suppressor system to protect test personnel against ear damage and to minimize annoyance to persons living nearby.

NORMAL EQUAL-LOUDNESS CONTOURS FOR PURE TONES AND NORMAL THRESHOLD OF HEARING UNDER FREE FIELD LISTENING CONDITIONS. International Organization for Standardization, Switzerland. ISO/R 226-1961 p 11

This ISO recommendation specifies the equal-loudness contours and threshold of hearing for subjects of normal hearing under the conditions of binaural hearing, with the subject directly facing the source of sound.

ON THE PREDICTION OF THE NEAR FIELD NOISE OF SUPERSONIC JETS. National Aeronautics and Space Administration. NASA CR-857 Aug. 1967 98 p

The phenomenon of noise generation by supersonic jets is reviewed in a comparison of previous theoretical and experimental investigations.

PERFORMANCE CHARACTERISTICS OF A LARGE FREE-FIELD EXPONENTIAL HORN. Marshall Space Flight Center. MSFC-MTP-Test-63-4 March 1963 33 p

This report presents the characteristics of a large electro-pneumatic transducer and exponential horn system which was installed at MSFC to simulate the rocket engine noise produced during a static test. The output of this system was found experimentally to be about 24 decibels lower than S-1 static tests.

PREDICTION OF AIRCRAFT SONIC BOOM CHARACTERISTICS FROM EXPERIMENTAL NEAR FIELD RESULTS. National Aeronautics and Space Administration. NASA TM X-1477 Nov. 1967 12 p refs

Near field pressure signature data measured in a wind tunnel were used for predicting aircraft sonic boom characteristics. It was determined that accurate sonic boom predictions can be made without accurate lift distribution and interference estimates.

PREFERRED FREQUENCIES FOR ACOUSTICAL MEASUREMENTS. American Standards Association. ASA S1.6-1960 3 p

This standard deals with the geometric series formed by test frequencies when a constant percentage increment is adopted.

PRELIMINARY MEASUREMENTS OF TAKE-OFF AND LANDING NOISE FROM A NEW INSTRUMENTED RANGE. C. S. Tanner and M. S. McLeod. In: Conference on Aircraft Operating Problems, Langley Research Center, May 10-12, 1965 p 83-90 (NASA SP-83)

This paper describes an acoustic measuring system installed at Edwards Air Force Base and presents some of the initial data obtained.

PRELIMINARY RESULTS OF SOUND PRESSURE LEVEL MEASUREMENTS DURING SA-5 LAUNCH. Kennedy Space Center. KSC TR-4-46-1 Feb. 1964 29 p

This report presents the preliminary evaluation of the acoustic data obtained during the launch of Saturn SA-5. It includes near- and far-field data graphs of the overall root-mean-square sound pressure levels in decibels versus time and power spectral plots of selected locations.

THE PRESENT STATUS OF BLAST ANALYSIS EXPERIMENTAL PROCEDURES, AND VULNERABILITY DATA. Bureau of Naval Weapons. NAVWEPS Rpt 8391 Nov. 1965 112 p (AD 368 452) (Confidential)

No abstract.

PRESENTATIONS AT NATIONAL AIRCRAFT NOISE SYMPOSIUM, NEW YORK. Federal Aviation Agency. FAA--Noise Symposium June 9, 1965 (AD 619 282)

This is a collection of papers presented by aeronautical experts who discuss their efforts to solve the noise problem.

PROCEDURE FOR DESCRIBING AIRCRAFT NOISE AROUND AN AIRPORT. International Organization for Standardization, Switzerland. ISO/R 507-1966

The purpose of this recommendation is to provide a means for describing the total noise exposure on the ground around an airport produced by one or a number of aircraft, of the same type or different types, operating under any known set of conditions.

PROCEEDINGS OF THE SONIC BOOM SYMPOSIUM. Papers Presented at the 70th Meeting of the Acoustical Society of America, Nov. 3, 1965, St. Louis, Mo. Journal of the Acoustical Society of America v 39 no. 5 pt 2 May 1966

These papers deal with sonic boom generation, propagation, prediction, and measurement, as well as the effects of sonic boom on people, buildings, and communities.

PROPOSED AMERICAN STANDARD PROCEDURE FOR THE COMPUTATION OF LOUDNESS OF NOISE. American Standards Association. ASA S3.4-1963 10 p

This standard specifies a procedure for calculating the loudness experienced by a typical listener under the following conditions: diffuse field, spectrum, steady state.

PSYCHOLOGICAL REACTIONS TO AIRCRAFT NOISE. K. D. Kryter. Science March 18, 1966 p 1346-1355. Reply. P. K. Holmes. May 13, 1966 p 865

The author presents possible methods of evaluating the acceptability of the noise from aircraft. P. K. Holmes, in a letter to the editor, states his belief that the annoyance values of sonic and subsonic aircraft can be compared in the manner described by Kryter.

QUIETER PLANES/THE DRIVE FOR SPACE APPLICATIONS. Space/Aeronautics June 1967 p 18-20

Steps are being taken by both government and private industry to alleviate the aircraft noise problem. NASA is researching the ideally quiet engine and new approach and take-off patterns are being designed.

REACTION TO AIRCRAFT NOISE. Aeronautical Systems Division. ASD-TR-61-610 Nov. 1961 138 p refs (AD 278 622)

This report discusses reactions to noise produced by aircraft in military operations. However, many of the concepts and relationships expressed can apply to noise problems in civil aviation and industry.

RECENT ACTIVITY IN THE NOISE AND HEARING FIELD. W. L. Baughn. Archives of Environmental Health April 1966 p 474-479 refs

This article gives brief résumés of conferences held and publications issued on the national and international scene in the noise and hearing field.

THE RELATIONS OF HEARING LOSS TO NOISE EXPOSURE. American Standards Association. ASA Rpt Z24-X-2 63 p

This report summarizes the facts obtained during ASA's exploration of the possibility of establishing bio- and psycho-acoustic criteria for noise control. It suggests no standards and proposes no criteria.

RESEARCH APPROACHES TO ALLEVIATION OF AIRPORT COMMUNITY NOISE. H. H. Hubbard et al. Journal of Sound and Vibration March 1967 p 377-390 refs

This paper contains a description of NASA-sponsored research undertaken for the alleviation of the noise problem in communities near commercial airports.

RESPONSE OF STRUCTURES TO AIRCRAFT GENERATED SHOCK WAVES. Wright Air Development Center. WADC TR 58-169 April 1959 138 p

The shock wave pressure levels generated by low-flying aircraft are low at ground level. Structural theory confirms experimental evidence that plaster walls are the most critically loaded components of residential structures, while glass and window frames are critical in all types of structures.

RESULTS OF SOUND PRESSURE LEVEL MEASUREMENTS DURING AS-201 LAUNCH; AS-203 LAUNCH, SA-7 LAUNCH, SA-8 LAUNCH, SA-9 LAUNCH, SA-10 LAUNCH. John F. Kennedy Space Center. KSC TR-305, KSC TR-403, KSC TR-90-1, KSC TR-177, KSC TR-166, KSC TR-184 1965-1966

These reports define the acoustic environment during the various launches.

RESULTS OF USAF-NASA-FAA FLIGHT PROGRAM TO STUDY COMMUNITY RESPONSES TO SONIC BOOMS IN THE GREATER ST. LOUIS AREA. National Aeronautics and Space Administration. NASA TN D-2705 May 1965 28 p

Particular attention is given to the results of interview studies involving residents of the community and to architectural and engineering evaluations of claimed damage incidents.

REVIEW OF CRITERIA FOR ESTIMATING DAMAGE TO RESIDENCES FROM BLASTING VIBRATIONS. Bureau of Mines. Rpt RI 5968 1962 19 p refs

In this report the authors evaluate the published experimental data pertaining to damage to determine if one set of reliable damage criteria can be established.

REVIEW OF RESEARCH AND METHODS FOR MEASURING THE LOUDNESS AND NOISINESS OF COMPLEX SOUNDS. National Aeronautics and Space Administration. NASA CR-422 April 1966 57 p

A detailed review of research and concepts underlying evaluation of subjective attributes of the loudness and noisiness of complex sounds is presented.

SATURN LAUNCH COMPLEX 37 AUTOMATIC GROUND CONTROL STATION ACOUSTIC AND VIBRATION STUDY. National Aeronautics and Space Administration. NASA CR 63-13 April 1963 23 p

The purpose of this study is to assist NASA in evaluating the structural capability of the Saturn Launch Complex 37 Automatic Ground Control Station facility to withstand the acoustic and seismic vibrations that occur during early launch phase.

SATURN SOUND FOCUSING PREDICTION AT LOC. Marshall Space Flight Center. MSFC-MTP-LVO-63-5 May 1963 41 p

This report is an analysis of the sound pressure level distribution during Saturn launchings as a function of atmospheric conditions. Means of determining such levels are developed, and conclusions relating the differing conditions between Huntsville, Alabama, and Cape Canaveral are set forth.

SCALING THE EFFECTS OF AIR BLAST ON TYPICAL TARGETS. H. S. Morton. APL Technical Digest Sept.-Oct. 1967 p 2-9

Interactions between shock waves, produced in air by detonation of explosives, and specific targets which they can destroy by air blast are described.

SHOCK AND VIBRATION HANDBOOK. C. M. Harris and C. E. Crede, eds. v 1-3 McGraw-Hill 1961 refs (TA355/H313)

This book "recognizes for the first time, the full scope of the field of shock and vibration by bringing together under one title classical vibration theory combined with modern applications of the theory to current engineering practice." Editors

SHOCK AND VIBRATION ENGINEERING. C. T. Morrow. Wiley 1963 384 p refs (TA355/M883)

A new technology is being developed to solve the problems of routine shock and vibration, based on those already existing.

SHOCK-ON-SHOCK EFFECTS EXPLORED IN NEW TEST FACILITY. C. J. Harris. Space/Aeronautics April 1967 p 117-118

This article describes the tests being conducted at a shock-on-shock aerodynamic test facility that was developed at the laboratory of the Experimental Fluid Physics Section of General Electric's Technology Center at Valley Forge, Pa.

SIMILARITY OF NEAR NOISE FIELDS OF SUBSONIC JETS. W. L. Howes. National Aeronautics and Space Administration. NASA TR R-94 67 p (AD 251 597)

Similarity relations for frequency-passband, as well as overall, time-averaged pressure fluctuations outside a jet are devised and tested using experimental data. Similarity of the pressure fields was found for different jet velocities.

SOME FACTORS INFLUENCING HUMAN RESPONSE TO AIRCRAFT NOISE: MASKING OF SPEECH AND VARIABILITY OF SUBJECTIVE JUDGMENTS. Federal Aviation Agency. FAA-ADS-42 June 1965 refs (AD 617 935)

Statistics of the variability of subjective judgments of the loudness and noisiness of pure tones and complex sounds as studied in the laboratory and in the field are presented. An analysis of possible sources or causes of this variability is made in terms of test-retest reliability, differences among subjects, types of sounds judged, and experimental methods used in obtaining judgments.

SONIC BOOM. Product Engineering March 15, 1965 p 88-89

Two aerospace engineers at NASA's Langley Research Center are experimenting with an airplane design which they hope will substantially reduce the boom of the SST.

SONIC BOOM BIBLIOGRAPHY. Federal Aviation Agency. FAA Bibliography Sept. 1964 15 p (AD 447 717)

No abstract.

SONIC-BOOM EXPOSURES DURING FAA COMMUNITY-RESPONSE STUDIES OVER A 6-MONTH PERIOD IN THE OKLAHOMA CITY AREA. National Aeronautics and Space Administration. NASA TN D-2539 78 p

Data are presented to illustrate the effects of the atmosphere during sonic-boom propagation.

SOUND AND STRUCTURAL VIBRATION. National Aeronautics and Space Administration. NASA CR-160 March 1965 215 p

This report is designed to give a systematic development to some new techniques for analyzing structural vibrations and the interactions between sound fields and structural vibrations.

SOUND-LEVEL MEASURING AND ANALYZING EQUIPMENT. U. S. Dept. of Defense. MIL-S-3151A Aug. 1967 26 p

This specification covers sound-level measuring and analyzing equipment consisting of a sound-level meter, an octave-band analyzer, and a magnetic tape recorder.

SOUND PRESSURE LEVEL MEASUREMENTS DURING SA-4 LAUNCH. Launch Operations Center. LOC TR-4-21-1 Oct. 1963 129 p

Evolution of the overall sound pressure levels recorded during the launch of SA 4 reveals that the five far-field stations recorded acoustic levels which are from 4 to 18 decibels lower than those recorded during the SA-3 launch and which are similar to those recorded during the SA-2 launch.

STRUCTURAL EFFECTS OF IMPACT. M. Kornhauser. Spartan Books 1964 refs (TA645.2/K84)

In his preface, the author states his hope that this book may serve as a working document for engineering estimates of impact effects. Chapters 4 and 10 concern air-blast effects on structures.

STRUCTURAL REACTION PROGRAM, NATIONAL SONIC BOOM STUDY PROJECT. Federal Aviation Agency. FAA SST 65-15 v 1 April 1965 178 p (AD 474 778)

"The primary overall objective was determination of sonic boom over pressure damage index levels associated with various types of structural material such as plaster, glass, and masonry. The structural test area at the Oscura Range Comp., White Sands Missile Range, included 21 structures varying in design, construction and age." Authors

STRUCTURAL RESPONSE TO SONIC BOOMS--FINAL REPORT. Federal Aviation Agency. FAA SST 65-1 v 1 Feb. 1965 228 p refs (AD 610 822)

This report documents results of the structural response of some residential structures in the Oklahoma City area during a 39-week controlled sonic boom testing program.

STUDIES OF SONIC BOOM INDUCED DAMAGE. National Aeronautics and Space Administration. NASA CR-227 May 1965 41 p

This report covers research of typical sonic boom damage claims, caused by specific supersonic aircraft test flights in the St. Louis, Missouri area, November 6 through 12, 1961, and January 3 through 6, 1962.

STUDY OF METHODS FOR ESTIMATING LOUDNESS. E. L. R. Corliss and G. E. Winzer. Journal of the Acoustical Society of American. Sept. 1965 p 424-428

"Experiments on measurement of impact sounds on concrete floors, vinyl tile over concrete, and oak blocks over concrete; comparison of methods for computing loudness developed by Zwicker with that of Stevens." Eng. X.

SUMMARY REPORT ON A STUDY OF THE BLAST EFFECT OF A SATURN VEHICLE. Arthur D. Little, Inc. ADL Summary Rpt C-63850 Feb. 1962 202 p (Confidential)

No abstract.

A SURVEY OF AERODYNAMIC NOISE. Air Force Flight Dynamics Laboratory. AFFDL-TDR-64-132 Dec. 1964 45 p (AD 611 173)

A representative survey of the literature of aerodynamic noise reveals that much of the research done in this field is either experimental or semi-empirical.

TEMPORARY THRESHOLD SHIFT IN SUCCESSIVE SESSIONS FOR SUBJECTS EXPOSED TO CONTINUOUS AND PERIODIC INTERMITTENT NOISE. Army Medical Research Laboratory. AMRL Rpt 604 March 1964 refs (AD 440 204)

This is a reprint of an article which appeared in the "Journal of Auditory Research," Vol. 3 1963. The authors suggest that the temporal condition of the acoustic reflex may be an operation factor.

THAT NOISE YOU HEAR MAY BE POLLUTION. SCIENTISTS FIGHTING NOISE POLLUTION. Business Week April 22, 1967 p 40-41

The writer states that "more people, more technology and machines" have increased the noise level to the point where it "disturbs work and sleep, makes conversation difficult, causes anxiety, and can permanently damage the ear." He thinks problems arising from annoying background noises are difficult to solve since little is known of the level of background noise people can tolerate.

THEORETICAL STUDY OF THE PROPAGATION OF SOUND--APPLICATION TO ANTICIPATION OF THE SONIC BOOM PRODUCED BY SUPERSONIC FLIGHT. NASA Technical Translation TTF-387 Dec. 1965

This document contains "notes of the course on higher aerodynamics presented at the Henri-Poincaré Institute (Theoretical Mechanics)."

AN UNOFFICIAL LARGE-VOLUME HYDROGEN AIR EXPLOSION. R. Reider et al. Pyrodynamics v 2 1965 p 249-261 refs

"The primary purpose of the experiment was to measure the acoustic sound levels in the test cell area during the release of hydrogen at high flow rates; these flow rates were of the order of 120 pounds per second." Authors

THE USE OF ACOUSTIC SCALE MODELS FOR INVESTIGATING NEAR FIELD NOISE OF JET AND ROCKET ENGINES. Wright Air Development Division. WADD TR 61-178 April 1961 90 p refs (AD 268 576)

Analyses show that the important characteristics of noise generation, propagation, and measurement can be scaled.

VIBRATION, SHOCK, AND ACOUSTIC ENVIRONMENTAL LEVELS LAUNCH COMPLEXES 34 AND 37 GROUND SUPPORT EQUIPMENT. Kennedy Space Center. KSC GP-320 March 28, 1967 11 p

This document presents the vibration and acoustic environmental levels of Launch Complexes 34 and 37, including the major ground support equipment.

WHEN NOISE ANNOYS. Time Aug. 19, 1966 p 24

This essay contains interesting comments on noise and its effects on man in his home and work environment. In the last paragraph the essayist expresses his ideas as to the method nature may take to solve the problem.